

THE CHARACTERISTICS AND DISTRIBUTION OF THE  
SPOTTED CUSK EEL *OTOPHIDIUM OMOSTIGMUM*  
(Jordan and Gilbert)

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The authors recently had the privilege of observing five living specimens of a rare cusk eel at Marineland, Florida.<sup>1</sup> Two additional individuals were later examined, one from Cortez Beach, Florida,<sup>2</sup> on the lower Gulf coast, and the other from Cedar Key, Florida, about 120 miles further north on the west coast. Since only two specimens had previously been reported (each described as a separate species), both the morphology and the behavior of these individuals were investigated with considerable interest.

*Otophidium omostigma* (Jordan and Gilbert)

*Genypterus omostigma* Jordan and Gilbert, 1882: 301-302 (Pensacola, Florida).

*Otophidium omostigma* Jordan, 1887: 914. Goode and Bean, 1895: 345, fig. 305 (Pensacola) Jordan, Evermann, and Clark, 1930: 485 (Pensacola snapper banks).

*Otophidium omostigma* Jordan and Evermann, 1898: 2490 (Snapper banks off Pensacola).

*Otophidium grayi* Fowler, 1948: 1-4, fig. 1 (Marineland, Florida).

DESCRIPTION

The initial values given in the text are the arithmetic means of all specimens measured; the values included in parentheses are the extremes. A robust species, probably attaining a larger size than the other members of this genus. Body depth (taken at dorsal origin) 6.0 (5.2 - 6.3) and head length 4.1 (3.9 - 4.6) in standard length. Head width 1.8 (1.6 - 2.1), snout 3.5 (3.2 - 3.9), eye diameter measured horizontally 4.4 (4.0 - 4.8), and bony interorbital

<sup>1</sup> We are indebted to the directors of the Marine Studios, Marineland, Florida, and to their Scientific Curator, Mr. F. G. Wood, for furnishing both facilities and specimens.

<sup>2</sup> Obtained as a loan from the University of Miami through the courtesy of Mr. Luis R. Rivas.

space 6.0 (5.1 - 7.1) all in head length. Eye diameter measures 1.3 (1.0 - 1.5) in snout. Mouth slightly inferior; maxillary slopes a little downward from front of snout and reaches to a point under the posterior edge of the pupil. A pair of inconspicuous nostrils on each side, the anterior nostril close to the tip of the snout and the posterior about halfway between the tip and the anterior edge of the eye. A broad band of villiform teeth in both jaws. Teeth on vomer larger, blunt, rounded, extended along the palatines in two or three rows. The gill rakers are large and each is provided with many minute, sharp spines; 4 (4 - 5) on the lower limb of the first arch, the lower three somewhat flattened and elongated; 7 (6 - 8) on second arch, knob-like.

The head is naked, the skin on the top being compressed into a series of very fine, parallel wrinkles. Scales small, thin, cycloid and imbedded in groups at irregular angles; 20 (17 - 24) in the predorsal series and approximately 160 - 185 along the lateral line to the caudal base. The lateral line can be seen as a small tube which disappears somewhat in front of the caudal base; it opens to the exterior through two series of pores, one above the line and another below.

The median rays were extremely difficult to count, since they are delicate and the fins are quite thick and fleshy. About 117 - 126 dorsal rays were found, about 85 - 95 anal, and 8 - 10 caudal. Pectoral rays 20 (19 - 22) and ventral rays 2; the outer ventral ray about twice as long as the inner; this entire ventral apparatus borne on a movable pedicle which projects from the chin (Figure 1).



Figure 1. Profile of head showing the ventral pedicle bearing the filaments.

(Figure 1).

The genus *Otophidium* is still in a most confused state. However, evidently four other western Atlantic species should be recognized, *O. marginatum* (DeKay), *O. schmidtii* Woods and Kanazawa, *O. welshi* Nichols

and Breder, and *O. holbrookii* (Putnam). *O. omostigmum* is immediately distinguishable by its unique color pattern which, fortunately, does not easily fade in alcohol. In fact, the only one of the

other four that possesses distinct markings on the body is *O. welshi*, but these are in the form of four longitudinal lines and could not be easily confused with the large, irregular blotches of *O. omostigmum*.

#### LIVE COLORATION

Though the color in alcohol has been adequately described by Goode and Bean (1895: 345), and Fowler (1948: 2), its coloration in life has not been previously reported.

Base color a light brown with a very definite pinkish cast, with dark, chocolate-brown blotches; somewhat darker above than below, though the above general colors persist, varying only in degree of intensity. The dorsal, anal, caudal, and pectoral fins edged in dark brown, with the exception of a chalk white area (persisting after preservation) on the edge of the dorsal, extending approximately  $1/10$  the length of the fin, beginning at a point about  $1/4$  the fin's length from its origin.

#### MATERIAL EXAMINED

University of Florida number 4572; five specimens from St. Augustine, Florida (three of these will be deposited elsewhere, at the U. S. National Museum, Stanford University, and the Chicago Natural History Museum). University of Florida number 4458; one from Cedar Key, Florida. Academy of Natural Sciences of Philadelphia number 71737; one (holotype of *Otophidium grayi*) from Marineland, Florida. University of Miami (not catalogued); one from Cortez Beach, Florida.

#### REMARKS

As is shown by Table 2, plus a comparison with available data on the holotype, certain ontogenetic changes in proportion are noticeable: the body depth becomes relatively greater, the inter-orbital space greater, and the snout longer. However, the changes which occur in the air bladder as the result of both growth and sexual maturity are the most interesting. Jordan and Gilbert (1882: 302) found a large posterior foramen in the air bladder of the holotype (a small specimen of only about 90 mm.). In all of our specimens (160 mm. to 293 mm.) the air bladder is entire and, also, a remarkable type of sex dimorphism is demonstrated. In the two

females this structure is more or less heart-shaped from a ventral view (Figure 2), but in the five males (the largest specimens) a prominent posterior projection (Figure 3) is developed. This protrusion is hollow and covered by a membrane at the distal end. Furthermore, this membrane is very elastic and presumably can extend a considerable distance into the coelomic cavity when pressure is exerted upon the comparatively rigid air bladder. Harry (1951: 32) first called attention to the widespread occurrence of this type of sexual dimorphism in the Ophidiidae. Its discovery in this species serves to further indicate it may be a fundamental characteristic of the entire family.



Figure 2. Outline of air bladder from a ventral view; anterior end to the right. Female.

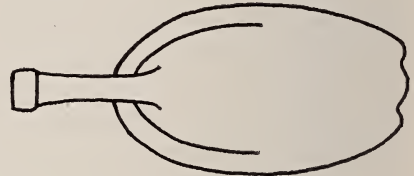


Figure 3. Outline of air bladder in same position as Figure 2. Male.

We consider *Otophidium grayi* Fowler to be a synonym of *O. omostigmum* (Jordan and Gilbert), because the original description of the latter plus the figure drawn by Todd and published by Goode and Bean (1882, figure 305) reveal no well-defined differences that could not be attributed to the juvenile state of the holotype.

TABLE 1  
Measurements in Millimeters of Seven Specimens

	Cedar Key Specimen	From Marineland, Florida					Cortez Beach Specimen
Standard length .....	160	215	255	255	258	260	293
Body depth .....	25.2	35.0	42.5	44.0	46.1	43.2	56.1
Head length .....	34.8	53.5	62.0	61.6	66.5	63.8	65.6
Head width .....	16.4	30.0	38.4	38.2	38.4	39.3	39.6
Snout .....	9.0	14.6	18.1	18.3	19.8	19.7	19.8
Eye diameter .....	8.7	12.6	13.0	13.2	15.7	13.5	13.6
Interorbital .....	5.3	7.5	12.1	10.8	10.7	11.2	12.1
Maxillary .....	13.8	21.0	24.2	25.0	27.5	25.5	28.8
Longest ventral ray .....	16.2	24.2	26.4	28.9	28.7	27.9	25.4

## RANGE

From Pensacola, Florida, in the Gulf of Mexico, around the peninsula to St. Augustine, Florida, on the Atlantic Coast.

TABLE 2

Measurements as per cent of standard length

	Cedar Key Specimen	From Marineland, Florida					Cortez Beach Specimen
Body depth .....	15.8	16.3	16.7	17.3	17.9	16.6	19.1
Head length .....	21.8	24.9	24.3	24.2	25.8	24.5	22.4
Head width .....	10.2	14.0	15.1	15.0	14.9	15.1	13.5
Snout .....	5.6	6.7	7.1	7.2	7.7	7.6	6.8
Eye diameter .....	5.4	5.9	5.1	5.2	6.1	5.2	4.6
Interorbital .....	3.3	3.5	4.7	4.2	4.1	4.3	4.1
Maxillary .....	8.6	9.8	9.5	9.8	10.7	9.8	9.8
Longest ventral ray .....	10.1	11.3	10.4	11.3	11.1	10.7	8.7

## HABITAT

At the Marine Studios this is not now considered a rare form, since individuals seem to be generally available during the cooler parts of the year. The east coast specimens were all taken on November 23, 1954, by an otter trawl over a mud bottom at 35 - 40 feet, about one mile off the beach at St. Augustine. The Cedar Key specimen was taken on March 10, 1953, in a shrimp net at 18 feet, about 8.5 miles west of the town of Cedar Key. The Cortez Beach individual was found dead, presumably killed by the red tide outbreak of December, 1953.

## OBSERVATIONS ON LIVE INDIVIDUALS

Observation of five live specimens at Marineland showed that the habits of this species have much in common with those of a Pacific cusk-eel (*O. taylori*) as reported by Herald (1953: 381). Though *O. omostigmum* never displayed the "tail standing" habit described for *O. taylori*, it did exhibit other habits noted for the latter species.

Individuals quickly buried themselves tail first on their sides, often until only the very tip of the snout protruded, though sometimes the burial was only partially completed. They burrowed in the open sand on the aquarium bottom, under flat rocks, and, on one occasion, beneath a small flounder which was itself buried

in the sand. Sometimes they would lie on their sides completely exposed, either prone or partially curled (Figure 5). In all cases of burial, partial burial, or exposed "side lying", the animals appeared dead, and considerable stimulation was usually needed in order to make them resume a swimming position. This sluggishness may account for their apparent rarity, since a trawl or other net might easily pass over one and fail to frighten it out of hiding and into the net.

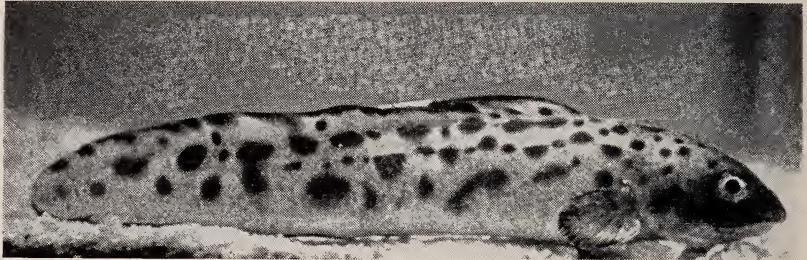


Figure 4. Live specimen in swimming position.

*O. omostigmum* shows a negative phototrophism, moving away from a strong artificial light and also away from a patch of sunlight in the aquarium. The ventral fins are highly movable and apparently have an important tactile and perhaps an olfactory function; they are kept in continuous motion as the fish swims along just off the bottom. Food was not accepted until after it came in contact with these ventral filaments.



Figure 5. Live specimen in resting position.

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